

The opinion in support of the decision being entered today  
is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* ANTONIUS HENDRICUS MARIA HOLTSLAG and  
JURGEN JEAN LOUIS HOPPENBROUWERS

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Appeal 2007-1283  
Application 09/772,477  
Technology Center 2600

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Decided: August 29, 2007

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Before KENNETH W. HAIRSTON, JAY P. LUCAS, and  
ST. JOHN COURTENAY III, *Administrative Patent Judges*.

COURTENAY, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) from the  
Examiner's rejection of claims 1-8. We have jurisdiction under  
35 U.S.C. § 6(b).

We AFFIRM.

## THE INVENTION

The disclosed invention relates generally to a method of displaying images on a subfield driven matrix display device. More particularly, the disclosed invention is directed to, *inter alia*, plasma display panels (PDP), plasma-addressed liquid crystal panels (PALCs), liquid crystal displays (LCDs), as well as Polymer LED (PolyLED), and Electroluminescent (EL) displays that are used for personal computers, televisions sets, and the like (Specification 1).

Independent claim 1 is illustrative:

1. A method of displaying successive image frames or fields on a subfield driven matrix display device comprising display lines being addressed in sets of adjacent lines, said image frames or fields having original luminance value data being coded in subfields comprising a group of most significant subfields and a group of least significant subfields, a common luminance value data being supplied to lines of a set of said sets of lines of at least one of the least significant subfields,

characterized in that said addressing in sets of adjacent lines of the at least one of the least significant subfields is performed differently for (i) successive frames or fields and/or (ii) for different regions of the display device and/or (iii) for different subfields.

## THE REFERENCES

Prince	US 5,508,716	Apr. 16, 1996
Wani	EP 0 890 941 A1	Jan. 13, 1999
Kida	US 6,018,329	Jan. 25, 2000
Huang	US 2001/0045924 A1	Nov. 29, 2001
Nagai	US 6,448,947 B1	Sep. 10, 2002

### THE REJECTIONS

Claims 1, 2, 3, 5, and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wani in view of Kida.

Claim 4 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Wani in view of Kida and Huang.

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Wani in view of Kida and Nagai.

Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Wani in view of Kida and Prince.

Rather than repeat the arguments of Appellants or the Examiner, we make reference to the Briefs, the Final Action, and the Answer for the respective details thereof.

### Claims 1, 2, 3, 5, and 8

We consider first the Examiner's rejection of claims 1, 2, 3, 5, and 8 as being unpatentable over Wani in view of Kida. Since Appellants' arguments with respect to this rejection have treated these claims as a single group which stands or falls together, we will select independent claim 1 as the representative claim for this rejection because we find it is the broadest independent claim before us. (*See* 37 C.F.R. § 41.37(c)(1)(vii)(2004)).

Appellants acknowledge that Wani teaches the subfields representing the less significant bits (referred to as the lower four bits) are displayed by interlace scanning (Br. 7). Appellants note that interlace scanning is a well known term of art, which means that every other line is scanned for one subfield, and the remaining lines are scanned for the next subfield (*id.*). Appellants further acknowledge that Wani teaches a second method where

two lines are addressed simultaneously with the same data. However, Appellants argue that both of these methods result in a loss of signal quality due to a loss of resolution and/or sharpness (*id.*).

In contrast, Appellants contend the instant invention improves upon prior art methods by grouping the lines differently in successive frames and/or different areas of the display, resulting in the desired reduction of the address period without an accompanying loss of resolution. Appellants point to page 2, lines 29-31 of Appellants' Specification for support (Br. 7).

Appellants note that the Examiner relies on Kida to show the driving of two neighboring rows as one unit in a first field, and for shifting the rows in a second field. Appellants argue that Kida makes no distinction between subfields having less significant bits. Thus, Appellants contend that applying Kida's technique to only some of the subfields would require an increase in the frame memory, and would not convert the interlaced scan signal to a progressive scan signal. Therefore, Appellants conclude the skilled artisan would not have been led by Kida to neighboring rows of only some of the subfields, i.e., the [lower] four bits of the Wani signal, scanned at the same [common] luminance (Br. 7-8). Appellants further assert that only with the aid of hindsight gleaned from Appellants' own teachings does the addressing of the same, or average, [i.e., common] luminance data to adjacent lines of only the least significant subframes become obvious (Br. 9).

The Examiner disagrees. In response to Appellants' argument that the combination of Wani and Kida would result in a loss of resolution and/or sharpness, the Examiner finds that Wani teaches partial interlace scanning in the lower bits [ $b_3, b_2, b_1, b_0$ ] in order to reduce addressing time (*See* Wani, col. 3, ll. 44-58). The Examiner finds that Kida teaches addressing bits within the subframes, wherein neighboring lines are assigned the same luminance value in order to reduce the addressing time (*See* Kida, col. 2, ll. 34-39 and 60-67; *see also* col. 6, l. 64 through col. 7, l. 17). Therefore, the Examiner concludes it would have been obvious to an artisan to modify Wani's system (which teaches reducing addressing time by performing interlace scanning only in subfields corresponding to the lower bits that have a short sustain time and small contribution to display brightness)<sup>1</sup> with Kida's method of addressing neighboring lines with the same luminance (i.e., the same pixel data, col. 7, ll. 11-13), also for the purpose of reducing addressing time (*see* Kida, col. 7, ll. 13-15). The Examiner notes that by reducing the addressing time the sustaining periods will be increased and the brightness of the display is also increased (Answer 3-4; *see also* Final Action 4).

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966). In addition to the findings under *Graham*, there

must also be “some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), *cited with approval in KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007). “[H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 127 S. Ct. at 1741, 82 USPQ2d at 1396.

We begin our analysis by first addressing Appellants’ contention that applying Kida’s technique to only some of the subfields would require an increase in the frame memory, and would not convert the interlaced scan signal to a progressive scan signal (*See Br. 8, ¶ 2*). We note that the negative limitation of not converting the interlaced scan signal to a progressive scan is not recited in the claims. Regarding a requirement to increase frame memory (as teaching away), we note that Kida specifically teaches that it is not necessary to increase the capacity of the frame memory:

From the foregoing, in *the interlace video signal* for the moving picture, *the pixel data are written on the two row electrodes at the same time*. Thus, the amount of pixel data is reduced half compared with the non-interlace video signal, and the *address period is also reduced half*. Therefore, even if the number of

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<sup>1</sup> (*See Wani*, col. 3, ll. 45-49).

sub-frames is increased for reducing the false contour, *it is not necessary to increase the capacity of the frame memory* <sup>24</sup> [emphasis added].

(Kida, col. 7, ll. 11-17).

We note that Wani also teaches shifting two neighboring scanning electrodes so as to scan two horizontal lines at a time, although this alternative method is applied only to the whole (i.e., progressive) scanning subfield <sup>2</sup> (i.e., the subfield associated with addressing the upper four bits [b<sub>7</sub>, b<sub>6</sub>, b<sub>5</sub>, b<sub>4</sub>] ):

As an alternative method of interlace scanning, two neighboring scanning electrodes may be selected simultaneously in the subfield that does not perform the non-interlace scanning (i.e., a quasi-whole scanning). Also in this case, the addressing period can be shortened by shifting the two neighboring scanning electrodes by one scanning line for writing data in the same way as the interlace scanning.

(Wani, col. 6, ll. 32-39).

We agree with the Examiner that Wani does not teach applying a common luminance value when addressing the sets of adjacent lines *of the at least one of the least significant subfields* that is performed differently for successive frames, for different regions of the display device, and/or for different subfields (i.e., Wani does not teach scanning two rows simultaneously with respect to the interlaced subfield described by Wani at col. 3, ll. 45-54) (see Final Action 3, ¶ 2). For this teaching, the Examiner

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<sup>2</sup> (See Wani, col. 2, ll. 55-58).

has combined Wani's interlaced subfield (corresponding to the least significant four bits, col. 3, ll. 49-54) with Kida's teaching of scanning two rows simultaneously that are further shifted by one row in successive fields (*See* Kida, col. 2, ll. 34-39 and 60-67; *see also* col. 6, l. 64 through col. 7, l. 17).

Regarding Appellants argument that Kida makes no distinction between subfields having less significant bits, we note that the Examiner has relied on Wani for this teaching (*See* Wani, col. 3, ll. 49-54). The Examiner's rejection is directed to the *combination* of Wani and Kida. The Court of Appeals for the Federal Circuit has determined that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097, 231 USPQ 375, 380 (Fed. Cir. 1986). Here, we agree with Appellants that Kida makes no distinction between subfields having less significant bits. However, Kida must be read, not in isolation, but for what it fairly teaches in combination with the prior art as a whole. We find Kida teaches scanning two rows simultaneously and shifting the rows scanned by one row in a first field and a second field (*See* Kida, col. 2, ll. 34-39 and 60-67; *see also* col. 6, l. 64 through col. 7, l. 17). We find Wani explicitly teaches displaying subfields corresponding to the least significant four bits using interlace scanning (col. 3, ll. 49-54). Thus, we agree with the Examiner that the combination of Wani and Kida teaches and/or suggests the instant invention of claim 1.

Regarding Appellants' argument that the methods of Wani and Kida result in a loss of display resolution, we find some loss of display resolution

does not preclude other motivations for combining Wani and Kida, such as the motivation of achieving maximum display brightness even with some loss of resolution. We further note that Wani is directed to the same problem addressed by Appellants' invention, i.e., how to shorten the addressing time so the sustain time can be extended to obtain an increase in display brightness (*See Wani*, col. 4, ll. 1-11).

With respect to the issue of hindsight, in *KSR* the U.S. Supreme Court reaffirmed that “[a] factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.” *KSR*, 127 S. Ct. at 1742, 82 USPQ2d at 1397. *See also Graham v. John Deere Co.*, 383 U.S. at 36, 148 USPQ at 474. Nevertheless, in *KSR* the Supreme Court also qualified the issue of hindsight by stating that “[r]igid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it.” *KSR*, 127 S. Ct. at 1742-43, 82 USPQ2d at 1397.

In *KSR*, the Supreme Court further stated:

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in

the same way, using the technique is obvious unless its actual application is beyond his or her skill.

*KSR*, 127 S. Ct. at 1740, 82 USPQ2d at 1396.

This reasoning is applicable here. We do not agree with Appellants' assertion that the Examiner has impermissibly engaged in hindsight in formulating the rejection. In contrast, we find the Examiner's proffered combination of Wani and Kida reasonably teaches and/or suggests Appellants' claimed invention in terms of *known elements* that would have been combined by an artisan having common sense using *known methods* to achieve a *predictable result* (See discussion of Wani and Kida *supra*). "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Leapfrog Enter., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161, 82 USPQ2d 1687, 1691 (Fed. Cir. 2007) (quoting *KSR*, 127 S. Ct. at 1739-40, 82 USPQ2d at 1395 (2007)). "One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims." *KSR*, 127 S. Ct. at 1742, 82 USPQ2d at 1397.

Thus, when we take account of the inferences and creative steps that a person of ordinary skill in the art would have employed, we conclude the Examiner has articulated an adequate reasoning with a rational underpinning that reasonably supports the legal conclusion of obviousness. For at least the aforementioned reasons, we conclude the Examiner has met the burden of presenting a *prima facie* case of obviousness. Accordingly, we will sustain

the Examiner's rejection of independent claim 1 as being unpatentable over Wani in view of Kida.

Pursuant to 37 C.F.R. § 41.37(c)(1)(vii), we have decided the appeal with respect to the remaining claims in this group on the basis of the selected claim alone. Therefore, we will sustain the Examiner's rejection of claims 2, 3, 5, and 8 as being unpatentable over Wani in view of Kida for the same reasons discussed *supra* with respect to representative claim 1.

#### Dependent claim 4

We consider next the Examiner's rejection of dependent claim 4 as being unpatentable over Wani in view of Kida and Huang.

Appellants argue that Huang does not teach or suggest applying a common luminance value to lines of a set of scanning lines of at least one of the least significant subfields, as claimed by Appellants' claim 1. Thus, Appellants contend that Huang adds no teachings to the combination of Wani and Kida which are relevant to the claimed invention. Therefore, Appellants conclude that claim 4, which further restricts the scope of claim 1, is patentable over the combination of Wani, Kida and Huang (Br. 10-11).

We note that Appellants have not presented any substantive arguments directed to the separate patentability of dependent claim 4 (*See* Br. 10-11). As discussed *supra*, we find no deficiencies in Wani and Kida with respect to independent claim 1, from which claim 4 depends. In particular, we find that Wani and Kida each teach scanning two horizontal rows *simultaneously* in a manner that *necessarily* applies a common

luminance value (i.e., corresponding to common pixel data) to two lines of a set of scanning lines (*See* Wani, col. 6, ll. 32-39; *see also* Kida, col. 7, ll. 11-17). Furthermore, the Examiner has combined Wani's teaching of displaying subfields corresponding to the least significant four bits using interlace scanning (col. 3, ll. 49-54) with Kida's teaching of scanning two rows simultaneously and shifting the two rows scanned by one row in a first field and a second field (*See* Kida, col. 2, ll. 34-39 and 60-67; *see also* col. 6, l. 64 through col. 7, l. 17). In the absence of a separate argument with respect to the dependent claims, those claims stand or fall with the representative independent claim. *See In re Young*, 927 F.2d 588, 590, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991). *See also* 37 C.F.R. § 41.37(c)(1)(vii)(2004). Therefore, we will sustain the Examiner's rejection of claim 4 as being unpatentable over Wani in view of Kida and Huang for the same reasons discussed *supra* with respect to independent claim 1.

#### Dependent claim 6

We consider next the Examiner's rejection of dependent claim 6 as being unpatentable over Wani in view of Kida and Nagai.

Appellants note that Nagi, like Huang, relates to the driving of plasma display devices. Appellants state that Nagi divides the matrix into first and second groups of electrodes arranged in parallel with each other, and pairs electrodes from the two groups. Appellants acknowledge that the prescribed discharge in Nagai's electrode pair groups is generated in units of the electrode pair groups at staggered timing (Br. 11).

Appellants further acknowledge that Nagi also teaches that his method of driving a plasma display panel can be applied to each of a plurality of subfields. Nevertheless, Appellants contend that Nagi does not teach or suggest applying a common luminance value to lines of a set of scanning lines of at least one of the least significant subfields, as claimed by Appellants' claim 1 (Br. 11-12).

We have fully addressed the limitations argued by Appellants with respect to claims 1 and 4 *supra*. We note that Appellants have not presented any substantive arguments directed to the separate patentability of dependent claim 6 (*See* Br. 10-11). As discussed *supra*, we find no deficiencies in Wani and Kida with respect to independent claim 1, from which claim 6 depends. In the absence of a separate argument with respect to the dependent claims, those claims stand or fall with the representative independent claim. *See In re Young*, 927 F.2d at 590, 18 USPQ2d at 1091. *See also* 37 C.F.R. § 41.37(c)(1)(vii)(2004). Therefore, we will sustain the Examiner's rejection of claim 6 as being unpatentable over Wani in view of Kida and Nagai for the same reasons discussed *supra* with respect to independent claim 1.

#### Dependent claim 7

Lastly, we consider the Examiner's rejection of dependent claim 7 as being unpatentable over Wani in view of Kida and Prince.

Appellants note that Prince discloses an addressing method and apparatus for increasing the selection ratio of an rms-responding, liquid crystal display by grouping together adjacent row electrodes and applying the same row addressing signal to each of the electrodes in a particular

group. Appellants state that the grouping of the row electrodes typically changes cyclically for subsequent addressing cycles (Br. 12).

Appellants contend Prince makes clear that addressing cycles apply to fields or frames of information. Appellants argue that Prince does not teach or suggest that these fields or frames are or may be divided into subfields or subframes of varying significance. Thus, Appellants conclude that Prince is no more relevant to Appellants' claimed invention than Kida, which together with Wani, fails to teach or suggest the invention claimed by claim 1, for the reasons previously stated (*id.*).

The Examiner disagrees. Regarding Appellants' argument that Prince does not teach or suggest fields or frames divided into subfields or subframes of varying significance, the Examiner notes that these limitations are not recited in claim 7. Instead, the Examiner points out that claim 7 further limits claim 1 by requiring that the "grouping of lines for each successive frame or field and for different regions of the display device is performed in a random manner" (claim 7). The Examiner contends Prince teaches that the number of row electrodes forming each group and the algorithm for changing the groupings of row electrodes in subsequent addressing cycles can be varied. Thus, the Examiner finds Prince, as combined with Wani and Kida, is relevant to Appellants' claimed invention (Answer 5-6).

We note that the initial burden of establishing unpatentability, on any ground, rests with the Examiner. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). "If that burden is met, the burden of coming forward with evidence or argument shifts to the applicant. After

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evidence or argument is submitted by applicant in response, patentability is determined on the totality of the record by preponderance of evidence with due consideration to persuasiveness of argument.” *Id.* at 1445, 24 USPQ2d at 1444.

Here, we agree with the Examiner that Appellants have failed to argue the limitations recited in claim 7. As discussed *supra*, we find no deficiencies in Wani and Kida with respect to independent claim 1, from which claim 7 depends. Thus, we find Appellants have not met the burden of coming forward with evidence or argument to rebut the Examiner’s legal conclusion of obviousness. Because we conclude the Examiner has met the burden of presenting a prima facie case of obviousness, which has not been overcome by any convincing arguments from Appellants, we will sustain the Examiner’s rejection of dependent claim 7 as being unpatentable over Wani in view of Kida and Prince.

#### DECISION

We have sustained the Examiner’s rejection of all claims on appeal. Therefore, the decision of the Examiner rejecting claims 1-8 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

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AFFIRMED

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